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Measuring Chemicals in People – What Does It Mean?

In October 1997, the Maryland Department of Health and Mental Hygiene (DHMH) prepared and distributed a report[1] that predicted new and challenging public health laboratory responsibilities such as molecular epidemiology, expanding newborn screening, food safety, and biomonitoring. After a decade, only biomonitoring has yet to experience any marked growth in state public health laboratories.

Protecting public health by reducing potential exposure to harmful chemicals is an important part of human biomonitoring. Biomonitoring is defined as the direct measurement of toxic substances in the human body using specimens such as blood, urine, organ tissues, saliva, or breast milk.

Biomonitoring has applications in identifying and helping to solve health problems in individuals; however, it must first identify problems in populations and then use population-based data to define appropriate diagnostic standards for individuals. This article explains why biomonitoring remains important even though it requires more partners and much broader fiscal and organizational resources than many other public health laboratory responsibilities. Given that the Centers for Disease Control and Prevention's (CDC) theme "Healthy People 2010" includes a focus on building public health infrastructure to help prevent diseases associated with exposure to toxic chemicals, we are hopeful that needed funding for more biomonitoring will become available in the future.

Challenges Of Chemical Exposure

The environment plays an important role in human health and development. Environmental chemicals are diverse and their expanded use in all facets of our lives has increased the risks of human exposure. These chemicals can contaminate our air, food, and water supplies. They can enter the human body by inhalation, ingestion, and dermal contact. Many published reports have indirectly or directly linked specific chronic diseases or serious health effects such as skin diseases, neurological disorders, organ dysfunction, cancer, and even death from exposure to environmental chemicals.

There are massive quantities of stored toxic chemicals and materials throughout the United States, often in close proximity to large industrial operations and densely populated urban centers. Additionally, large quantities of toxic chemicals and materials are often transported through or near metropolitan areas. A public health emergency involving exposure to toxic chemicals could result from exposure in a natural disaster, an accidental release, or a terrorist incident. Exposure can affect human health and

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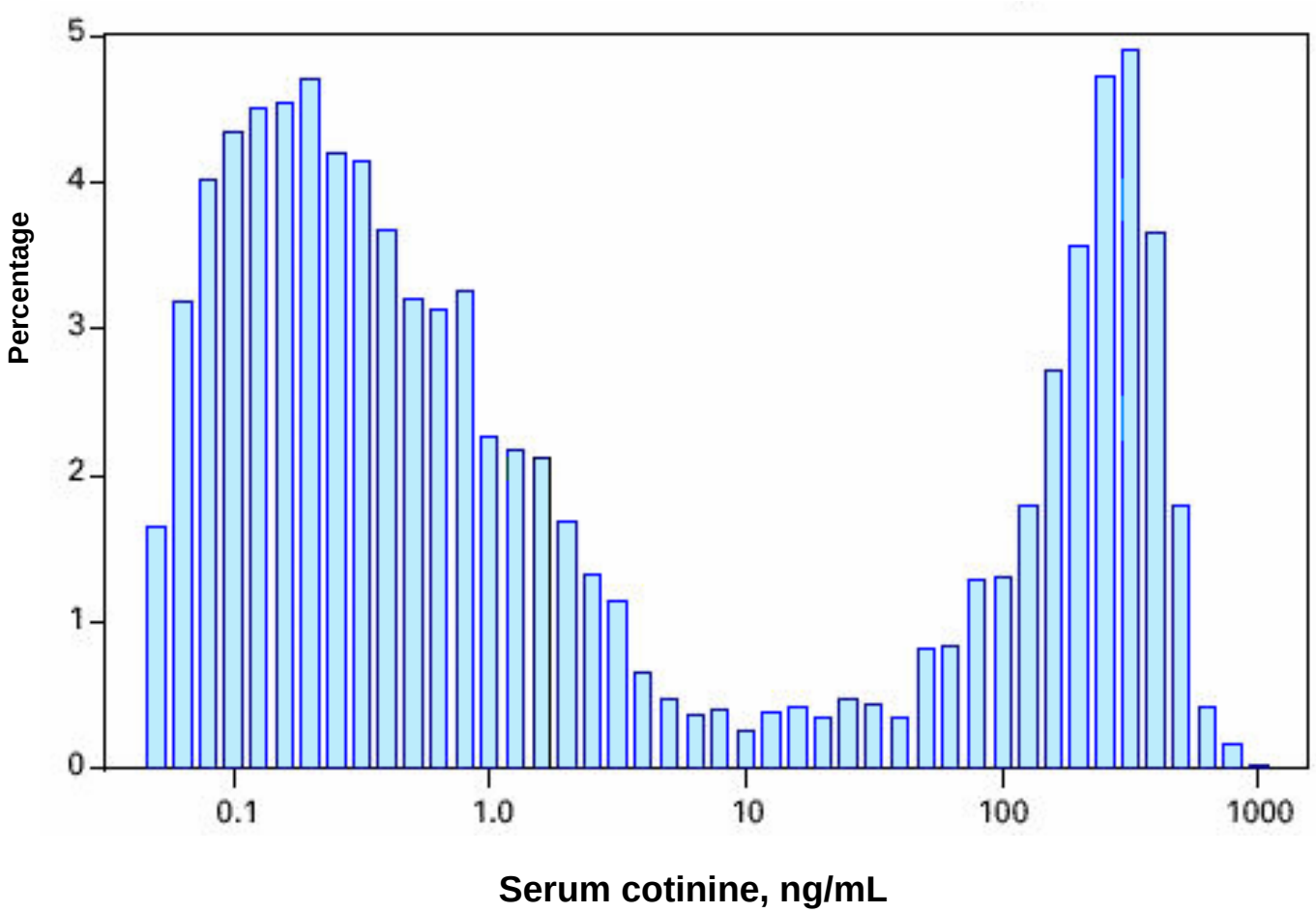
Figure 1.
Serum cotinine levels among persons aged ≥ 4 years - United States, third National Health and Nutrition. Examination Survey, 1988-1991*



Smokers have higher levels of serum cotinine. Nonsmokers with measurable cotinine levels include those who reported no exposure to environmental tobacco smoke in the home or work site.

Source: CDC Public Image Library: http://phil.cdc.gov/phil/details.asp

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safety and the environmental ecosystems. For example, in 1984, in the city of Bhopal, India, a Union Carbide chemical plant leaked the industrial chemicals methyl isocyanate, hydrogen cyanide, carbon monoxide, and monomethyl amine gases into the atmosphere. This resulted in over 3,000 deaths and thousands of other individuals with permanent or partial disabilities.[2]

The CDC has compiled a list of over 500 chemical contaminants that includes 30 biotoxins, 9 explosives, 17 radioisotopes, and 30 chemical warfare agents. The remainder consists of toxic industrial chemicals. The Environmental Protection Agency (EPA) registered about 30% of these industrial chemicals as components of pesticide products or mixtures. Of the industrial chemicals on the list, only 54% have sufficient health and safety information, 7% have some information, and 38% have very little information.

National Program Directions

In 2005, the CDC published the "Third National Report on Human Exposure to Environmental Chemicals"[3] (NHANES.) It contains a comprehensive statistical summary of typical population exposure data in humans tested for 148 environmental chemicals. These chemicals include metals, pesticides, polycyclic aromatic hydrocarbons, dioxins, furans, polychlorinated biphenyls, phthalates, and phytoestrogens.

The CDC report establishes reference ranges for physicians, epidemiologists, and scientists to determine typical high exposures, including lower and upper values ex-

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pressed as 95% confidence intervals using creatinine adjusted and unadjusted geometric means. The report mentions it is impossible to relate measured exposure levels to health outcomes. It also shows distribution of the population with "above-toxicity" levels of chemicals with known toxicity. In essence, the report provides an ongoing assessment of the U.S. population's exposure to environmental chemicals in different groups stratified by age categories, gender, and race/ethnicity. The CDC reports have been released at two-year intervals. If CDC continues to release future reports, it will be possible to determine if exposure levels overall, particularly in selected high-risk groups, increase, decrease, or remain the same over time. One limitation of this report, however, is the absence of zip code data on human exposure.

Biomonitoring Basics[4, 5, 6]

Biomonitoring measurements that assess the concentration of toxic chemicals in people and are often referred to as "internal dose" measurements. Biomonitoring only measures exposure. Biomonitoring measurements can assess the exposure of a single person or of many people (a population) by aggregating data. It does not provide information about toxicity or risk from the target compounds. Biomonitoring measurements complement environmental monitoring of toxic chemicals in air, water, food, soil, and dust. Environmental (or extrinsic) measurements are indirect and quite variable, and therefore, can add significantly to the uncertainties and inaccuracies in data calculations. Biomonitoring provides us with the ability to make health risk assessments about potential exposure. It also can provide sufficient information to guide decisions concerning behaviors that may contribute to individuals being exposed to an environmental hazard, or the need to seek medical intervention to mitigate exposure effects.

The three components of a biomonitoring program include a scientifically robust study, interpretation of data for potential risks to human health, and communication of results to public health officials and physicians to improve outcomes in protecting public health. The mere detection of a compound in the body at any level should not be interpreted to mean adverse health effects are likely to occur. Biomonitoring exposure data must be integrated into risk assessment processes. Better estimates of intrinsic concentrations of toxic chemicals in humans can be integrated with other exposure indicators, as well as epidemiological and toxicological data to make reliable risk assessments and better public health decisions. Therefore, developing an innovative biomonitoring program within the confines of a state health department is a significant step to developing reliable risk assessments that can lead

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to better public health decisions and to new legislation that will protect state residents from being exposed to toxic environmental chemicals.

The interpretation of the data should be directed at establishing baseline information about exposure rather than equating measurement with risk. The outcome should be a data-based approach to provide the public with the resources to identify real health risks versus trivial assumptions. Federal agencies such as the CDC and the EPA are responsible for assessing and determining the progress the U.S. is making in abating exposure of chemicals in the environment and to people.

Exposure And Measurement

When chemicals enter the body, they leave markers reflecting this exposure. Markers can be the parent compounds themselves, breakdown products, or transformed products. These biomarkers help us understand the linkage between human exposure, dose, and health effects. For example, cotinine is a biomaker of exposure to cigarette smoke (see Figure 1) and 3-phenoxybenzoic acid is a biomaker of exposure to pyrethroid pesticides. Measurements of a chemical in humans does not mean anything if the health effects are unknown. On the other hand, if the health effects of a chemical were known, as they are for lead, it would be easier to mitigate the chemical's effect or institute medical intervention.

Low levels of environmental chemicals are typically observed in biomonitoring studies. This raises additional questions. Can these low levels have any significant effect in humans? How can these results be effectively communicated to the individual or population? Although biomonitoring studies produce scientifically credible data, the CDC and EPA face challenges in determining what the analytical measurements really mean, or in interpreting the results and making meaningful conclusions about public health.

Currently, biomonitoring data is mainly used to: (a) evaluate effectiveness of public health efforts to reduce population exposure to chemicals; (b) determine disparities of exposure levels among minorities, children, women of childbearing age, and other potentially vulnerable groups; (c) track trends in levels of exposure over time and space; and (d) provide a basis for future research on human health effects.

Predicting levels of toxicants in people using environmental monitoring is very difficult and must include many assumptions. Mathematical modeling is used to predict levels of toxicants in people by determining correlations between different chronic diseases and other health outcomes with the levels of contaminants in water, air, food, and soils/dust; lifestyle (economic status); personal habits (smoking); genetic factors; absorption coefficients; and nutritional status. Testing clinical samples is preferred because: (a) estimating individual doses from analyzing environmental samples is difficult; (b) environmental samples may be inadequate or non-existent; (c) clinical specimens provide specific dose-effect relationships; and (d) they provide guidance in the clinical management of an exposed population. As a result, biomonitoring provides a direct measure of total exposure from all sources by all routes. However, the limitations are: (a) biomonitoring cannot define the relative contributions of the individual sources on people, (b) exposure data is only one point in time, (c) analytical methodology selected, and (d) statistical range within which results can be measured.

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Maryland Environmental Public Health Tracking Program

Since the fall of 2002, and until 2011, DHMH has received funding from the CDC to establish and maintain an Environmental Public Health Tracking (EPHT) program. The EPHT program provides ongoing collection, integration, analysis, interpretation, and distribution of data on environmental contaminants, human exposure, and any associated health effects.

The main objectives of Maryland's EPHT program are to: (a) develop Maryland norms for exposure values; (b) correlate findings of pesticide exposure with possible association to reported human illnesses; (c) to evaluate spatial distribution of human exposure using the Geographic Information System in Maryland residential zip codes; and (d) develop a measure of an individual's actual exposure to toxic substances such as pesticides and other statistical correlations.

By June 2008, the Maryland EPHT program will establish the Maryland Tracking Network (MTN). The MTN will be an internet site that will initially contain data on environmental hazards, chronic diseases, and other health outcomes. By September 2008, the MTN will be able to exchange data on environmental hazards, exposure to hazards, and chronic diseases/health outcomes with 16 other funded tracking networks.

Primary biomonitoring efforts in Maryland have involved a dual emphasis on childhood blood lead levels and pesticide exposures. With the first public release of the MTN, there will be de-identified and aggregated results for children tested for exposure to lead as well as prevalence measures for the percentage of children with elevated blood lead levels in different Maryland counties. Users will be able to access these de-identified and aggregated blood lead data through the MTN web page. Data queries can be created to select results based on personal characteristics of children tested (age, gender, race), county of residence, and year tested.

In Maryland, there is a pesticide reporting regulation.[7] All health care providers in the State are required to report to the DHMH Office of Environmental Health Coordination about any individual who has been exposed to pesticides. Currently, there are self-reports about intentional and unintentional pesticide exposures available from the Maryland Poison Control Center, but there is a lack of data on Maryland residents who have been exposed to pesticides.

Testing Capabilities

For biomonitoring analytical methods to be effective in addressing public health needs, they must be accurate, precise, sensitive, specific, and have the capacity for rapid throughput. The Laboratories Administration's Division of Environmental Chemistry (DEC) has been an active partner in the Maryland EPHT program since the fall of 2002. Contributions include validating analytical methods and the capability to analyze human urine and blood for toxic metals, chlorinated pesticides, metabolites of organophosphate and pyrethroid pesticides, volatile organic compounds, and cyanide.

The DEC detects toxic metals in urine and blood using an inductively coupled plasma-mass spectrometer (ICP-MS) equipped with a dynamic reaction cell technology. For the five classes of organic compounds, a capillary gas chromatograph-mass spectrometer (GC/MS), utilizing either electron impact or chemical ionization and operating in the selected ion monitoring mode, is employed. Target compounds can be measured in very low concentration levels, usually in the low parts per million and parts per million ranges, using an isotope dilution technique.

Clinicians who suspect pesticide, cyanide, volatile organic, or heavy metal poisoning in a patient should telephone the Analytical Toxicology Section at 410-767-4388 or 410-767-5643 for guidance on sample collection, packaging, and transport to the laboratory for testing. Urine specimens are collected in sterile containers and immediately transported to the laboratory at 4 ºC. In the field, urine specimens must be frozen at -40 ºC if they cannot be delivered to the laboratory within six hours after collection. Blood samples must be collected in prescribed color-coded vacutainers and should be stored cold but not frozen.

This article is written by Sadia Muneem and Lahanda Punyasena of the Environmental Toxicology Program, Division of Environmental Chemistry.

References

[1] Maryland Department of Health and Mental Hygiene. *Public Health Laboratory for the 21st Century*. Baltimore, MD October 1997.

[2] http://www.bhopal.org/index.html

[3] Centers for Disease Control and Prevention. *Third National Report on Human Exposure to Environmental Chemicals*. CDC, Atlanta, GA 2005. http://www.cdc.gov/exposurereport/report.htm.

[4] Currier, M., M. McNeill, D. Campbell, et al. *Human Exposure to Mosquito Control Pesticides – Mississippi, North Carolina, and Virginia, 2002 and 2003*. *MMWR 54*:529-32, 2005.

[5] *Protecting Americans through Better Chemical Exposure Monitoring*. Sept. 25, 2007. http://www.webwire.com/viewpressrel.asp?aId=48705.

[6] BiomonitoringInfo.org. http://www.biomonitoringinfo.org/basics/defined.html

[7] Code of Maryland Regulations (COMAR) 10.06.01.03(B)(40-1). *Pesticide Related Illnesses*. Online pesticide related illness reporting form is at https://www.cha.state.md.us/oeh/html/hcp/hcp.cfm.

Laboratory Statistics

NS – Not Speciated
NT – Non-Typeable
VRE – Vancomycin Resistant
SP – Species
NG – No Growth

* This genus has recently been given a new genus name. The genus name in parenthesis is the old name.
** Formerly a part of the *Trichosporon beigelii* complex.
*** Alpha streptococci other than *S. pneumoniae* and *Enterococcus*

REPORTED 11/01/07 - 11/30/07

ENTERIC BACTERIOLOGY

GENUS SEROVAR	SEX	AGE	#	JURISDICTION
CAMPYLOBACTER COLI				
	F	63	1	BALTIMORE CITY
CAMPYLOBACTER JEJUNI				
	M	52	1	ALLEGANY
	F	18	1	BALTIMORE
	M	39	1	BALTIMORE
	F	42	1	BALTIMORE CITY
	M		1	BALTIMORE CITY
ESCHERICHIA COLI O157:H7				
	F	55	1	WASHINGTON
SALMONELLA BARDO				
	F		1	BALTIMORE
	M	2	1	BALTIMORE CITY
	M	19	1	BALTIMORE CITY
SALMONELLA BAREILLY				
	F	66	2	BALTIMORE
	F		1	CHARLES
	U	9	1	OUT OF STATE
SALMONELLA BLOCKLEY				
	F	71	1	BALTIMORE
SALMONELLA BRAENDERUP				
	F	20	1	PRINCE GEORGE'S
SALMONELLA DUBLIN				
	F	53	1	ANNE ARUNDEL
SALMONELLA ENTERITIDIS				
	F	38	1	ALLEGANY
	F	44	1	ALLEGANY
	M	26	1	ALLEGANY
	F		1	BALTIMORE
	F	4	1	BALTIMORE
	F	19	1	BALTIMORE
	F	31	1	BALTIMORE
	M	45	1	BALTIMORE
	M	7	1	CHARLES
	F	25	1	FREDERICK
	F	34	1	HARFORD
	F	30	1	MONTGOMERY
	M	3	1	PRINCE GEORGE'S
	M	7	2	PRINCE GEORGE'S
	M	11	1	PRINCE GEORGE'S
	M	22	1	PRINCE GEORGE'S
	F		1	BALTIMORE CITY
	F	1	2	BALTIMORE CITY
	F	2	1	BALTIMORE CITY
	F	3	1	BALTIMORE CITY
	F	5	1	BALTIMORE CITY
	F	7	1	BALTIMORE CITY
	F	18	1	BALTIMORE CITY
	F	29	1	BALTIMORE CITY
	F	32	1	BALTIMORE CITY
	F	68	1	BALTIMORE CITY
	M		2	BALTIMORE CITY
	M	1	1	BALTIMORE CITY
	M	13	1	BALTIMORE CITY
	M	17	1	BALTIMORE CITY
	M	18	1	BALTIMORE CITY
	M	25	1	BALTIMORE CITY
	M	41	1	BALTIMORE CITY
	M	45	1	BALTIMORE CITY
	U		1	BALTIMORE CITY
	U	4	1	BALTIMORE CITY
	F	63	1	OUT OF STATE
	M	9	1	OUT OF STATE
SALMONELLA HEIDELBERG				
	M	28	1	ANNE ARUNDEL
	F	2	1	PRINCE GEORGE'S
	F	8	1	WASHINGTON
	F	10	1	OUT OF STATE
SALMONELLA I 6,7:k:-				
	M	1	2	GARRETT
	U		1	OUT OF STATE
SALMONELLA ISRAEL				
	F		1	ST. MARY'S
SALMONELLA JAVA				
	M	54	1	MONTGOMERY
SALMONELLA JAVIANA				
	M	2	1	ANNE ARUNDEL
	M	11	1	ANNE ARUNDEL
	M	42	1	HARFORD
	M	42	1	OUT OF STATE
	M	55	1	OUT OF STATE
SALMONELLA LITCHFIELD				
	M	73	1	KENT
SALMONELLA MONTEVIDEO				
	F	6	1	MONTGOMERY
	M		1	BALTIMORE CITY
SALMONELLA NEWPORT				
	F	36	1	ANNE ARUNDEL
	M	104	1	BALTIMORE
	F	46	1	FREDERICK
	M	16	1	MONTGOMERY
	M	44	1	MONTGOMERY
	F	1	1	OUT OF STATE
SALMONELLA NORWICH				
	F	1	1	WICOMICO
SALMONELLA ORANIENBURG				
	M	2	1	ANNE ARUNDEL
	F	5	1	MONTGOMERY
	F	8	1	MONTGOMERY
	M	1	1	BALTIMORE CITY
SALMONELLA POONA				
	F	1	1	ANNE ARUNDEL
SALMONELLA SAINTPAUL				
	M	86	1	BALTIMORE CITY
SALMONELLA SANDIEGO				
	F	73	1	MONTGOMERY
SALMONELLA TENNESSEE				
	F		1	CECIL
SALMONELLA TYPHI				
	U	76	1	MONTGOMERY
SALMONELLA TYPHIMURIUM				
	M	2	1	MONTGOMERY
	M	59	1	PRINCE GEORGE'S
	F		1	QUEEN ANNE'S
	F	59	1	BALTIMORE CITY
	M	1	1	BALTIMORE CITY
	F	83	1	OUT OF STATE
	M	11	1	OUT OF STATE

SALMONELLA TYPHIMURIUM VAR COPENHAGEN			
F	88	1	HOWARD
F	2	1	TALBOT
F	14	1	TALBOT
F	82	1	BALTIMORE CITY
SALMONELLA UNTYPABLE			
F	77	1	TALBOT
SALMONELLA VIRCHOW			
U	42	1	OUT OF STATE
SALMONELLA 4,5,12:i:-			
M	5	1	BALTIMORE
M	68	1	CAROLINE
F	33	1	GARRETT
U	9	1	PRINCE GEORGE'S
U	44	1	WICOMICO
F	52	1	BALTIMORE CITY
SHIGELLA BOYDII 2			
U		2	BALTIMORE CITY
SHIGELLA FLEXNERI VAR Y -:3,4			
M	18	1	BALTIMORE CITY
SHIGELLA SONNEI			
M	8	1	CHARLES
F	48	1	MONTGOMERY
M		1	MONTGOMERY
U	5	1	MONTGOMERY
F	7	1	PRINCE GEORGE'S
F	2	1	BALTIMORE CITY
F	5	1	BALTIMORE CITY
TOTAL		**120**	

ISOLATES – THROAT CULTURES

COUNTY	GROUP A[1]	NON-GROUP A
ALLEGANY	2	23
FREDERICK	1	0
MONTGOMERY	3	1
PRINCE GEORGE'S	1	4
SOMERSET	2	3
WICOMICO	4	11
BALTIMORE CITY	1	3
TOTAL	**14**	**45**

[1] *Streptococcus pyogenes*

BACTERIOLOGY IDENTIFICATIONS
Referrals

GENUS SPECIES SOURCE	#	JURISDICTION
BURKHOLDERIA CEPACIA COMPLEX		
SPUTUM	1	ANNE ARUNDEL
HAEMOPHILUS INFLUENZAE NON-TYPEABLE		
BLOOD	1	WICOMICO
HAEMOPHILUS INFLUENZAE SEROTYPE F		
BLOOD	1	BALTIMORE CITY
PERICARDIAL	2	BALTIMORE
HAEMOPHILUS PARAINFLUENZAE		
BLOOD	1	PRINCE GEORGE'S
HAEMOPHILUS PARAPHROPHILUS		
BLOOD	1	PRINCE GEORGE'S
MORAXELLA OSLOENSIS		
BLOOD	1	WASHINGTON
STAPHYLOCOCCUS AUREUS		
LEG	1	WICOMICO
LESION	1	WICOMICO
SPUTUM	1	WICOMICO
URINE	2	WICOMICO
WOUND	1	WICOMICO
TOTAL	**14**	

ISOLATES – MISCELLANEOUS

GENUS SPECIES SOURCE	#	JURISDICTION
ACINETOBACTER LWOFFII		
TOE	1	FREDERICK
BACILLUS SPECIES		
TOE	1	FREDERICK
WOUND	1	FREDERICK
WRIST	1	MONTGOMERY
CORYNEBACTERIUM SPECIES		
ABSCESS	1	BALTIMORE CITY
WOUND	1	FREDERICK
VAGINAL	1	MONTGOMERY
VULVAR	1	SOMERSET
ENTEROBACTER CLOACAE		
TOE	1	FREDERICK
WOUND	1	FREDERICK
FOOT	1	FREDERICK
ENTEROCOCCUS FAECIUM		
BLOOD	1	BALTIMORE CITY
BLOOD	2	BALTIMORE CITY
ESCHERICHIA COLI		
BLOOD	3	BALTIMORE CITY
VAGINAL	2	CECIL
GARDNERELLA VAGINALIS		
CERVIX	1	ANNE ARUNDEL
VAGINAL	2	PRINCE GEORGE'S
VAGINAL	3	SOMERSET
KLEBSIELLA OXYTOCA		
BLOOD	1	BALTIMORE CITY
KLEBSIELLA PNEUMONIAE		
WOUND	1	BALTIMORE CITY
BLOOD	1	BALTIMORE CITY
PANTOEA AGGLOMERANS		
WOUND	1	BALTIMORE CITY
TOE	1	FREDERICK
PSEUDOMONAS AERUGINOSA		
BLOOD	1	BALTIMORE CITY
WOUND	1	FREDERICK
FOOT	1	FREDERICK
EAR	1	MONTGOMERY
PSEUDOMONAS PUTIDA		
BUTTOCK	1	BALTIMORE CITY
SERRATIA MARCESCENS		
FOOT	1	FREDERICK
SERRATIA PLYMUTHICA		
BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS AUREUS		
BOIL	1	BALTIMORE CITY
BUTTOCK	1	BALTIMORE CITY
CERVIX	1	BALTIMORE CITY
SHIN	1	BALTIMORE CITY
ABSCESS	1	BALTIMORE CITY
ELBOW	1	BALTIMORE CITY
NECK	1	BALTIMORE
WOUND	1	BALTIMORE
BOIL	1	CARROLL
CYST	1	CARROLL
LESION	2	FREDERICK
TOE	4	FREDERICK
WOUND	2	FREDERICK
WOUND	2	FREDERICK
FOOT	2	FREDERICK
VAGINAL	1	MONTGOMERY
VAGINAL	1	PRINCE GEORGE'S
STAPHYLOCOCCUS AURICULARIS		
BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS COAGULASE NEGATIVE		
BLOOD	1	BALTIMORE CITY
CSF	1	BALTIMORE CITY
STAPHYLOCOCCUS EPIDERMIDIS		
BLOOD	1	BALTIMORE CITY
STAPHYLOCOCCUS WARNERI		
BLOOD	1	BALTIMORE CITY

STREPTOCOCCUS BETA-HEMOLYTIC GROUP A		
CSF	1	BALTIMORE CITY
WOUND	1	BALTIMORE CITY
STREPTOCOCCUS BETA-HEMOLYTIC GROUP B		
VAGINAL	2	ANNE ARUNDEL
CERVIX	2	ANNE ARUNDEL
BLOOD	1	BALTIMORE CITY
VAGINAL	1	BALTIMORE
LESION	1	FREDERICK
VAGINAL	4	HOWARD
VAGINAL	8	PRINCE GEORGE'S
VAGINAL	4	SOMERSET
STREPTOCOCCUS SALIVARIUS		
BLOOD	1	BALTIMORE CITY
TOTAL	**92**	

SEXUALLY TRANSMITTED DISEASES

GENUS SPECIES

SEX	#	JURISDICTION
NEISSERIA GONORRHEAE		
F	2	ANNE ARUNDEL
M	4	ANNE ARUNDEL
F	1	BALTIMORE
M	4	BALTIMORE
M	1	CARROLL
F	2	CECIL
M	1	CECIL
M	1	CHARLES
M	2	DORCHESTER
M	1	FREDERICK
F	2	HARFORD
M	1	HARFORD
F	1	MONTGOMERY
M	2	MONTGOMERY
F	7	PRINCE GEORGE'S
M	25	PRINCE GEORGE'S
U	1	PRINCE GEORGE'S
F	1	QUEEN ANNE'S
F	2	SOMERSET
M	4	SOMERSET
F	1	TALBOT
M	1	TALBOT
M	1	WASHINGTON
F	2	WICOMICO
M	3	WICOMICO
F	1	BALTIMORE CITY
M	8	BALTIMORE CITY
M	1	OUT OF STATE
TOTAL	**83**	
CHLAMYDIA TRACHOMATIS		
F	5	ALLEGANY
F	20	ANNE ARUNDEL
M	14	ANNE ARUNDEL
F	26	BALTIMORE
M	13	BALTIMORE
F	4	CALVERT
M	3	CALVERT
F	2	CAROLINE
F	2	CARROLL
M	1	CARROLL
F	2	CECIL
M	2	CECIL
F	8	CHARLES
M	5	CHARLES
M	1	DORCHESTER
F	9	FREDERICK
M	4	FREDERICK
F	8	HARFORD
M	9	HARFORD
F	6	HOWARD
M	1	HOWARD
M	1	KENT
F	14	MONTGOMERY
M	14	MONTGOMERY
U	2	MONTGOMERY
F	62	PRINCE GEORGE'S
M	28	PRINCE GEORGE'S
F	3	QUEEN ANNE'S
M	1	QUEEN ANNE'S
F	5	SOMERSET
M	1	SOMERSET
F	3	TALBOT
M	1	TALBOT
F	5	WASHINGTON
M	4	WASHINGTON
F	25	WICOMICO
M	12	WICOMICO
U	1	WICOMICO
F	1	WORCESTER
F	11	BALTIMORE CITY
M	29	BALTIMORE CITY
M	3	OUT OF STATE
TOTAL	**371**	
SYPHILIS SEROLOGY		
F	1	ALLEGANY
M	1	ANNE ARUNDEL
F	5	BALTIMORE
M	1	BALTIMORE
F	4	BALTIMORE CITY
M	13	BALTIMORE CITY
M	1	CAROLINE
F	1	CHARLES
M	1	CHARLES
F	1	DORCHESTER
U	1	DORCHESTER
F	2	FREDERICK
F	4	MONTGOMERY
M	3	MONTGOMERY
F	4	PRINCE GEORGE'S
M	18	PRINCE GEORGE'S
F	1	TALBOT
M	2	TALBOT
M	1	WASHINGTON
F	2	WICOMICO
M	4	WICOMICO
TOTAL	**71**	

PENICILLIN RESISTANT GONORRHEA STATISTICS

REPORTED QUARTERLY
NO REPORT THIS MONTH

MYCOBACTERIOLOGY

GENUS SPECIES

SEX	AGE	#	JURISDICTION
MYCOBACTERIUM AVIUM COMPLEX			
M	65	1	BALTIMORE
M	78	1	BALTIMORE
F	68	1	FREDERICK
F	41	1	BALTIMORE CITY
M	48	1	BALTIMORE CITY
F	53	1	BALTIMORE CITY

MYCOBACTERIUM CHELONAE			
F	49	1	MONTGOMERY
MYCOBACTERIUM GORDONAE			
M	30	1	BALTIMORE CITY
M	39	1	BALTIMORE CITY
MYCOBACTERIUM MARINUM			
M	60	1	ANNE ARUNDEL
M	49	1	BALTIMORE
MYCOBACTERIUM TUBERCULOSIS			
M	43	1	MONTGOMERY
M	45	1	MONTGOMERY
M	20	1	MONTGOMERY
MYCOBACTERIUM TUBERCULOSIS COMPLEX			
M	27	1	ANNE ARUNDEL
M	37	1	CHARLES
F	28	1	HOWARD
F	67	1	MONTGOMERY
M	45	1	MONTGOMERY
F	27	1	MONTGOMERY
M	20	1	MONTGOMERY
M	22	1	MONTGOMERY
M	24	1	MONTGOMERY
F	27	1	MONTGOMERY
M	20	1	MONTGOMERY
M	39	1	BALTIMORE CITY
F	22	1	OUT OF STATE
TOTAL		**27**	

MYCOBACTERIUM SUSCEPTIBILITY RESULTS

DURING NOVEMBER, 2007, SUSCEPTIBILITY RESULTS ON 35 ISOLATES OF *M. TUBERCULOSIS* COMPLEX * WERE IDENTIFIED.

TOTAL: 11 DRUG RESISTANT STRAINS FOUND

#	COUNTY	DRUG
1	ANNE ARUNDEL	® to STREPTOMYCIN
1[B]	BALTIMORE	® to PYRAZINAMIDE
2[A]	CALVERT	® to STREPTOMYCIN
2[A]	HOWARD	® to STREPTOMYCIN
1	HOWARD	® to RIFAMPIN
3[A]	MONTGOMERY	® to STREPTOMYCIN
1	WASHINGTON DC	® to ISONIAZID

[A] Two isolates from the same patient
[B] Probable *M. bovis*

® RESISTANT

**Mycobacterium tuberculosis* complex consists of:
M. tuberculosis
M. bovis
M. bovis, BCG
M. africanum
M. microti
M. canettii

MYCOLOGY

GENUS SPECIES	SEX	AGE	#	JURISDICTION
ALTERNARIA				
	M	80	1	ALLEGANY
	F	67	1	CARROLL
	F	40	1	TALBOT
ASPERGILLUS FLAVUS				
	M	78	1	MONTGOMERY
	M	52	1	PRINCE GEORGE'S
ASPERGILLUS FUMIGATUS				
	U	0	1	ANNE ARUNDEL
	U	0	1	ANNE ARUNDEL
	F	61	1	ANNE ARUNDEL
	M	77	1	CALVERT
	F	38	1	CECIL
	F	65	1	CHARLES
	M	54	1	PRINCE GEORGE'S
ASPERGILLUS NIGER				
	F	69	1	TALBOT
ASPERGILLUS OCHRACEUS				
	M	36	1	ALLEGANY
ASPERGILLUS VERSICOLOR				
	M	8	1	FREDERICK
CANDIDA ALBICANS				
	F	16	1	BALTIMORE
	F	20	1	BALTIMORE
	F	24	1	CECIL
	M	70	1	FREDERICK
	F	24	1	FREDERICK
	F	53	1	MONTGOMERY
	F	55	1	MONTGOMERY
	M	20	1	MONTGOMERY
	M	44	1	MONTGOMERY
	F	44	1	MONTGOMERY
	F	58	1	PRINCE GEORGE'S
	F	69	1	PRINCE GEORGE'S
	M	77	1	PRINCE GEORGE'S
	M	74	1	PRINCE GEORGE'S
	U	73	1	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	23	1	PRINCE GEORGE'S
	F	44	1	PRINCE GEORGE'S
	F	19	1	PRINCE GEORGE'S
	F	21	1	PRINCE GEORGE'S
	F	0	1	SOMERSET
	F	0	1	SOMERSET
	F	18	1	SOMERSET
	F	19	1	SOMERSET
	F	20	1	SOMERSET
	F	23	1	SOMERSET
	M	20	1	SOMERSET
	F	54	1	BALTIMORE CITY
	F	62	1	BALTIMORE CITY
	M	59	1	BALTIMORE CITY
	M	61	1	BALTIMORE CITY
	M	66	1	BALTIMORE CITY
	M	12	1	BALTIMORE CITY
	M	35	1	BALTIMORE CITY
CANDIDA GLABRATA				
	F	77	1	BALTIMORE
	F	53	1	MONTGOMERY
	F	55	1	MONTGOMERY
	M	74	1	MONTGOMERY
	F	54	1	BALTIMORE CITY
	F	62	1	BALTIMORE CITY
	M	61	1	BALTIMORE CITY
CANDIDA KRUSEI				
	F	35	1	ALLEGANY
CANDIDA PARAPSILOSIS				
	F	47	1	BALTIMORE
	F	56	1	CALVERT
	F	69	1	FREDERICK
	M	55	1	PRINCE GEORGE'S
	M	79	1	PRINCE GEORGE'S
CANDIDA TROPICALIS				
	M	74	1	MONTGOMERY
CHAETOMIUM				
	M	80	1	ALLEGANY
	M	64	1	ALLEGANY
CLADOSPORIUM SPECIES				
	M	66	1	TALBOT
	M	73	1	BALTIMORE CITY

CURVULARIA				
	F	9	1	TALBOT
	F	24	1	TALBOT
	M	68	1	TALBOT
	M	65	1	WICOMICO
FUSARIUM SPECIES				
	F	60	1	BALTIMORE
	U	78	1	TALBOT
KOH PREP				
	M	61	1	BALTIMORE CITY
MARINUM				
	M	49	1	BALTIMORE
MICROSPORUM CANIS				
	F	4	1	ALLEGANY
	F	6	1	ALLEGANY
MOULD				
	F	51	1	ANNE ARUNDEL
	F	67	1	TALBOT
	M	52	1	TALBOT
	M	76	1	TALBOT
	M	77	1	WICOMICO
NIGROSPORA SPECIES				
	M	80	1	ALLEGANY
PAECILOMYCES SPECIES				
	M	80	1	BALTIMORE
PENICILLIUM SPECIES				
	M	62	1	ALLEGANY
	M	73	1	ALLEGANY
	F	71	1	ANNE ARUNDEL
	M	70	1	ANNE ARUNDEL
	M	73	1	CALVERT
	F	0	1	CHARLES
	M	58	1	CHARLES
	M	67	1	PRINCE GEORGE'S
	F	40	1	TALBOT
	F	82	1	TALBOT
	M	66	1	TALBOT
	M	68	1	TALBOT
RHODOTORULA				
	F	22	1	PRINCE GEORGE'S
	F	18	1	SOMERSET
SCOPULARIOPSIS SPECIES				
	M	9	1	ALLEGANY
TRICHOPHYTON MENTAGROPHYTES				
	M	82	1	ANNE ARUNDEL
TRICHOPHYTON RUBRUM				
	F	59	1	MONTGOMERY
TRICHOPHYTON TONSURANS				
	M	8	1	BALTIMORE
	M	10	1	BALTIMORE
	M	7	1	CARROLL
	F	3	1	TALBOT
TRICHOSPORON INKIN				
	F	20	1	FREDERICK
YEAST				
	M	45	1	TALBOT
TOTAL			**107**	

ARTHROPOD IDENTIFICATION

NONE

TICK IDENTIFICATION

NONE

PARASITOLOGY

GENUS SPECIES	#	JURISDICTION
PROTOZOA		
BLASTOCYSTIS HOMINIS	2	ANNE ARUNDEL
	4	FREDERICK
	2	MONTGOMERY
	1	PRINCE GEORGE'S
DIENTAMOEBA FRAGILIS	1	ANNE ARUNDEL
	3	FREDERICK
	1	PRINCE GEORGE'S
ENDOLIMAX NANA	11	FREDERICK
	4	MONTGOMERY
	5	PRINCE GEORGE'S
	1	ST MARY'S
ENTAMOEBA COLI	1	BALTIMORE CITY
	3	MONTGOMERY
	2	PRINCE GEORGE'S
	2	SOMERSET
GIARDIA LAMBLIA	1	PRINCE GEORGE'S
IODAMOEBA BUTSCHLII	1	PRINCE GEORGE'S
TOTAL	**45**	
NEMATODES		
ENTEROBIUS VERMICULARIS	3	CARROLL
	1	FREDERICK
NECATOR AMERICANUS	1	FREDERICK
TRICHURIS TRICHIURA	1	FREDERICK
TOTAL	**6**	

WATER MICROBIOLOGY

	# TESTED	**# NON-COMPLIANT**
COMMUNITY	4	0
NON-COMMUNITY	212	97
TOTAL	**216**	**97**

FOOD SAFETY

FOOD AND SHELLFISH MICROBIOLOGY

	# OF SAMPLES	**NOTABLE PATHOGENS**
FOOD	5	0
		# STANDARDS EXCEEDED *
CRABMEAT	0	0
		# STANDARDS EXCEEDED **
SHELLFISH	0	0
SHELLFISH GROWING WATERS	200	
OTHER†	2	0
TOTAL	**207**	**0**

†**CLOSTRIDIUM** BOTULINUM TOXIN / TYPE B INFANT BOTULISM

STANDARDS

* CRABMEAT-FRESH
ESCHERICHIA COLI = LESS THAN 36 MPN/100 GRAM
STANDARD PLATE COUNT = LESS THAN 100,000 PER GRAM

** SHELLFISH
FECAL COLIFORMS = LESS THAN 230 MPN/100 GRAM
STANDARD PLATE COUNT = LESS THAN 500,000 PER GRAM

VIRUS ISOLATION

ISOLATE	SEX	AGE	#	JURISDICTION
COXSACKIE VIRUS A9				
	F	18	1	SOMERSET
SUBTOTAL			**1**	
HERPES SIMPLEX VIRUS TYPE 1				
	U	22	1	ALLEGANY
	F	19	1	ALLEGANY
	F	20	1	ANNE ARUNDEL
	F	18	1	BALTIMORE
	F	22	1	BALTIMORE
	F	20	1	CARROLL
	F	17	1	CHARLES
	M	18	1	CHARLES
	F	17	1	PRINCE GEORGE'S
	F	21	3	PRINCE GEORGE'S
	F	22	1	PRINCE GEORGE'S
	F	23	3	PRINCE GEORGE'S
	F	23	1	PRINCE GEORGE'S
	F	24	1	PRINCE GEORGE'S
	M	20	1	PRINCE GEORGE'S
	M	33	1	PRINCE GEORGE'S
	F	0	1	SOMERSET
	F	19	1	SOMERSET
	F	22	1	SOMERSET
	F	18	1	WICOMICO
	F		1	WICOMICO
	F	21	1	WICOMICO
	M	0	1	BALTIMORE CITY
	F	17	1	BALTIMORE CITY
	F	16	1	BALTIMORE CITY
	M	18	1	BALTIMORE CITY
	M	19	1	BALTIMORE CITY
	U	24	1	BALTIMORE CITY
	F	21	1	BALTIMORE CITY
	F	26	1	BALTIMORE CITY
	M	39	2	BALTIMORE CITY
	F	38	1	OUT OF STATE
SUBTOTAL			**37**	
HERPES SIMPLEX VIRUS TYPE 2				
	F	22	1	ANNE ARUNDEL
	F	21	1	BALTIMORE
	F	23	3	BALTIMORE
	F	25	2	BALTIMORE
	F	39	1	BALTIMORE
	M	25	1	BALTIMORE
	M	58	1	BALTIMORE
	U	17	1	BALTIMORE
	F	19	1	CALVERT
	F	21	1	CHARLES
	F	17	1	FREDERICK
	F	21	1	FREDERICK
	F	32	1	FREDERICK
	M	22	1	FREDERICK
	M	42	1	FREDERICK
	M	43	1	HARFORD
	M	23	1	HOWARD
	F	29	1	MONTGOMERY
	F	34	1	MONTGOMERY
	F	19	2	PRINCE GEORGE'S
	F	21	1	PRINCE GEORGE'S
	F	27	1	PRINCE GEORGE'S
	F	31	1	PRINCE GEORGE'S
	F	33	1	PRINCE GEORGE'S
	M	19	1	PRINCE GEORGE'S
	M	22	1	PRINCE GEORGE'S
	M	23	1	PRINCE GEORGE'S
	M	25	1	PRINCE GEORGE'S
	M	27	1	PRINCE GEORGE'S
	F	17	1	QUEEN ANNE'S
	F	25	1	TALBOT
	M	20	1	WASHINGTON
	F	21	1	WICOMICO
	F	23	1	WICOMICO
	F	28	1	WICOMICO
	F	39	1	WICOMICO
	M	27	1	WICOMICO
	F		1	BALTIMORE CITY
	F	9	1	BALTIMORE CITY
	F	15	1	BALTIMORE CITY
	F	18	1	BALTIMORE CITY
	F	20	1	BALTIMORE CITY
	F	22	1	BALTIMORE CITY
	F	23	3	BALTIMORE CITY
	F	28	1	BALTIMORE CITY
	F	30	1	BALTIMORE CITY
	F	38	1	BALTIMORE CITY
	F	54	1	BALTIMORE CITY
	F	57	1	BALTIMORE CITY
	M	17	1	BALTIMORE CITY
	M	19	1	BALTIMORE CITY
	M	20	1	BALTIMORE CITY
	M	25	1	BALTIMORE CITY
	M	27	1	BALTIMORE CITY
	M	29	2	BALTIMORE CITY
	M	42	1	BALTIMORE CITY
	M	43	1	BALTIMORE CITY
	M	48	1	BALTIMORE CITY
	M	50	1	BALTIMORE CITY
	M	87	1	BALTIMORE CITY
	U	29	1	BALTIMORE CITY
	U	40	1	BALTIMORE CITY
	U	47	1	BALTIMORE CITY
SUBTOTAL			**70**	
TOTAL			**108**	

VIRAL HEPATITIS

ORGANISM	# OF SPECIMENS	POSITIVES	JURISDICTION
HEPATITIS A			
	1	0	ANNE ARUNDEL
	6	0	BALTIMORE
	1	0	BALTIMORE CITY
	2	0	CALVERT
	5	0	CARROLL
	4	0	HARFORD
	6	0	MONTGOMERY
	4	0	PRINCE GEORGE'S
	2	0	WICOMICO
SUBTOTAL	**31**	**0**	
HEPATITIS B			
	52	0	ALLEGANY
	82	0	ANNE ARUNDEL
	60	8	BALTIMORE
	790	8	BALTIMORE CITY
	6	0	CALVERT
	1	0	CAROLINE
	44	1	CARROLL
	149	1	CECIL
	3	0	CHARLES
	101	1	FREDERICK
	13	0	GARRETT
	59	1	HARFORD
	35	0	HOWARD
	4	0	KENT
	281	6	MONTGOMERY

	391	11	PRINCE GEORGE'S
	1	0	QUEEN ANNE'S
	5	0	SOMERSET
	10	0	TALBOT
	1	0	UNKNOWN
	36	3	WASHINGTON
	131	0	WICOMICO
SUBTOTAL	**2,255**	**40**	
HEPATITIS C			
	51	3	ALLEGANY
	85	24	ANNE ARUNDEL
	60	2	BALTIMORE
	318	135	BALTIMORE CITY
	7	0	CALVERT
	1	1	CAROLINE
	38	8	CARROLL
	78	9	CECIL
	2	0	CHARLES
	107	3	FREDERICK
	13	0	GARRETT
	23	3	HARFORD
	20	5	HOWARD
	4	0	KENT
	40	2	MONTGOMERY
	197	5	PRINCE GEORGE'S
	1	0	QUEEN ANNE'S
	2	0	SOMERSET
	10	0	TALBOT
	1	0	UNKNOWN
	15	2	WASHINGTON
	20	0	WICOMICO
SUBTOTAL	**1,093**	**202**	
TOTALS	**3,379**	**242**	

RABIES

SOURCE	#	JURISDICTION
FOX	1	MONTGOMERY
	1	TALBOT
	1	WORCESTER
GROUNDHOG	1	CHARLES
OTHER	1	WICOMICO
RACCOON	1	ALLEGANY
	1	ANNE ARUNDEL
	2	BALTIMORE
	1	FREDERICK
	1	GARRETT
	3	HARFORD
	1	HOWARD
	5	MONTGOMERY
	1	PRINCE GEORGE'S
	1	WICOMICO
	2	BALTIMORE CITY
SKUNK	1	FREDERICK
	1	ST. MARY'S
TOTAL POSITIVES	**26**	
TOTAL SPECIMENS	**313**	

CHLAMYDOPHILIA (CHLAMYDIA) PSITTACI

REPORTED QUARTERLY
NO REPORT THIS MONTH

CD4 FLOW CYTOMETRY WORKLOAD

REPORTED QUARTERLY
NO REPORT THIS MONTH

NEWBORN & CHILDHOOD SCREENING

STATISTICS FOR NOVEMBER 2007

PRESUMPTIVE POSITIVES

DISORDERS	#
PHENYLKETONURIA	2
MAPLE SYRUP URINE DISEASE	4
HOMOCYSTINURIA	8
TYROSINEMIA	5
ARGININEMIA	0
CITRULLINEMIA	0
GALACTOSEMIA	2
BIOTINIDASE DEFICIENCY	0
HYPOTHYROIDISM	68
HEMOGLOBIN -DISEASE	28
HEMOGLOBIN -BENIGN	413
CONGENITAL ADRENAL HYPERPLASIA (CAH)	33
CYSTIC FIBROSIS	0
FATTY ACID OXIDATIONS	14
ORGANIC ACIDEMIAS	14
ACYLCARNITINE - BORDERLINE	4
ACYLCARNITINE - OTHERS	6

MONTHLY TOTALS

# OF SPECIMENS SCREENED	10,650
NUMBER OF TESTS	962,859
% OF UNSATISFACTORY SPECIMENS	5.5

YEAR-TO-DATE CONFIRMED CASES

CONDITIONS	# CONFIRMED
MCAD	2
3MCC	3
SCAD	2
VLCAD	2
GA-I	0
3-HYDROXY 3 METHYLGLUTTARYL COALYASE DEFICIENCY (HMG)	1
MAPLE SYRUP URINE DISEASE	2
PKU- CLINICALLY SIGNIFICANT	2
VARIATANT HYPERPHENYLALANINEMIA - NOT CLINICALLY SIGNIFICANT	2
GALACTOSEMIA- CLASSICAL GALT DEFICIENCY	3
GALACTOSEMIA - VARIANT	1
BIOTINIDASE DEFICIENCY	2
GALACTOSE EPIMERASE DEFICIENCY	0
GALACTOSE TRANSFERASE DEFICIENCY- (GALT CLASSICAL)	1
PARTIAL BIOTINIDASE DEFICIENCY	2
CAH- CLASSICAL SALT WASTING	2
CAH-NON-CLASSICAL	0
HYPOTHYROIDISM - PRIMARY	7
HYPOTHYROIDISM - SECONDARY	2
OTHER HYPOTHYROIDISM	6
TRANSIENT HYPOTHYROIDISM	1
SICKLE CELL DISEASE -SS	10
SICKLE CELL DISEASE -SC	5
SICKLE CELL DISEASE -S BETA THALASSEMIA	2
CYSTIC FIBROSIS	8

HIV ANTIBODY SCREENING – BLOOD

STATISTICS FOR NOVEMBER 2007

SPECIMEN SOURCES	TOTAL	POSITIVE EIA	%	POSITIVE WB	%
HEALTH DEPARTMENTS AND CLINICS	2,190	105	4.79%	95	90.48%
HOSPITALS	124	6	4.84%	6	100.00%
DETENTION CENTERS	519	7	1.35%	7	100.00%
PRIVATE PHYSICIANS	10	0	0.00%	0	0.00%
STUDENT HEALTH CLINICS	285	2	0.70%	0	0.00%
EMPLOYEE HEALTH CLINICS	12	0	0.00%	0	0.00%
AUTOPSIES	315	21	6.67%	13	61.90%
ORGAN/TISSUE DONORS	59	0	0.00%	0	0.00%
TOTAL	**3,514**	**141**	**4.01%**	**121**	**85.82%**

ENVIRONMENTAL CHEMISTRY

SAMPLES	# NON-COMPLIANT	# TESTED
ASBESTOS		
AIR	0	0
BULK	4	24
AIR QUALITY		
$PM_{2.5}$	0	429
PM_{10}	0	0
RADIATION		
AIR/CHARCOAL FILTERS	0	72
MILK	0	4
WIPES	0	65
RAW WATER	0	14
VEGETATION	0	0
OTHER	0	14
DRINKING WATER		
METALS		
COMMUNITY	4	9
NON-COMMUNITY	3	5
PRIVATE WELLS	102	366
PESTICIDES & PCBs		
COMMUNITY	0	66
NON-COMMUNITY	0	21
PRIVATE WELLS	0	1
VOLATILE ORGANIC COMPOUNDS		
COMMUNITY	3	257
NON-COMMUNITY	1	110
PRIVATE WELLS	0	125
RADIATION		
COMMUNITY	18	44
NON-COMMUNITY	0	0
PRIVATE WELLS	2	9
INORGANICS		
COMMUNITY	0	1
NON-COMMUNITY	3	41
PRIVATE WELLS	6	213
FOOD CHEMISTRY		
SUSPECTED TAMPERING	0	0
MICROSCOPIC FILTH	0	0
LABELING	0	0
SURVEILLANCE	0	0
CHEMICAL CONTAMINATION	0	0
TOTAL	**146**	**1,890**

LEAD ENVIRONMENTAL

TEST	#	ELEV	BRL	UNSAT
TOTAL PAINT	4	2	0	1
TOTAL SOIL	0	0	0	0
DUST				
FLOOR	326	32	269	0
SILL	536	15	356	0
WELL	315	25	132	2
OTHER	6	2	3	0
TOTAL DUST	1,183	74	760	2
GRAND TOTAL	**1,187**	**76**	**760**	**3**

INTERPRETATION OF RESULTS:
# = Number of Samples Received
ELEV= Elevated
BRL= Below Reporting Limit
UNSAT = Unsatisfactory
PAINT Positive in excess of 0.5%
SOIL Action level 400 - 5,000 ppm
DUST Clearance limits: Floor/Other 40 ug/sq ft
Window Sill 250 ug/sq ft
Window Well 400 ug/sq ft

LEAD SCREENING - BLOOD LEAD

CLASS		RANGE ug/dl	# TESTED
MARYLAND			
	I	<10	133
	IIA	10-14	4
	IIB	15-19	6
	III	20-44	14
	IV	45-69	0
	V	>69	0
TOTAL			**157**
WASHINGTON DC			
	I	<10	49
	IIA	10-14	0
	IIB	15-19	0
	III	20-44	0
	IV	45-69	0
	V	>69	0
TOTAL			**49**

VIRAL LOAD SPECIMENS

STATISTICS FOR NOVEMBER 2007

HIV–1 RNA Copies/ml	$<10^3$	$10^3 – 10^4$	$10^4 – 10^5$	$>10^5$	TOTALS
ALLEGANY COUNTY HEALTH DEPARTMENT	9	0	1	0	10
FREDERICK COUNTY HEALTH DEPARTMENT	1	1	1	0	3
MONTGOMERY COUNTY HEALTH DEPARTMENT	90	12	15	9	126
PRINCE GEORGE'S COUNTY HEALTH DEPARTMENT	70	7	13	9	99
SOMERSET COUNTY HEALTH DEPARTMENT	1	0	0	0	1
WASHINGTON COUNTY HEALTH DEPARTMENT	1	3	0	0	4
WICOMICO COUNTY HEALTH DEPARTMENT	0	0	1	0	1
SUBTOTALS	**172**	**23**	**31**	**18**	**244**
DEPARTMENT OF CORRECTIONS	49	19	34	8	110
TOTALS	**221**	**42**	**65**	**26**	**354**

MAILING LABEL

Maryland Department of Health & Mental Hygiene
J. Mehsen Joseph Public Health Laboratory
Critical Link c/o Georgia Corso L-15
201 West Preston Street
Baltimore Maryland 21201